carried in a fluid medium, such as an aqueous solution to which surface areas 40 and 42 are exposed. **FIG. 3** illustrates beads 20 and 22, and species immobilized relative thereto, drawn to surface locations 40 and 42. The beads need be drawn within proximity to the surface locations only to the extent that the identification of signaling entities immobilized with respect to bead 20 can be identified. In one embodiment, signaling entities **30** are visibly identifiable. In this embodiment signaling entities 30 can be colloid particles (the aggregation proximate the surface of bead 20 will cause the bead to exhibit a blue or purple color distinguishable from other beads), can be fluorescent moieties, fluorescent particles or the like. In such a case, electrodes 44 and 46 are not required; it is only required that the beads be drawn magnetically to separate locations. When this has occurred, surface location 40 is identified as one that has attracted signaling entity 30, and location 42 as identified as one that has not attracted a signaling entity 30.

[0060] In another embodiment, the signaling entity comprises an electroactive molecule such as a redox-active species, the presence of which in proximity to electrode **44**, and the absence of which in proximity to electrode 46, can be determined via known electrochemical techniques such as CV and ACV. Such electroactive molecules typically are metal-containing redox-active molecules including transition metal complexes, i.e., complexes including metals selected from, but not limited to, cadmium, copper, cobalt, palladium, zinc, iron, ruthenium, rhodium, osmium, rhenium, platinum, scandium, titanium, vanadium, chromium, manganese, nickel, molybdenum, technetium, tungsten, and iridium. Particularly preferred are ruthenium, osmium, iron, platinum, and palladium, with ruthenium and iron being especially preferred. Complexes including these metals will include the metals along with ligands such as, for example, isonicotinamide, imidazole, bipyridine, terpyridine, phenanthrolines, carbon monoxide, isocyanide, and metallocene ligands, including substituted derivatives of the above. Other ligands will be apparent to those of ordinary skill in the art. A particularly preferred metal complex of the invention is a metallocene complex, especially ferrocene, which includes an iron atom and two cyclopentadiene ligands, or a derivative thereof.

[0061] The signaling entity (31, first illustrated in **FIG. 3** but optionally present in other figures) immobilized with respect to protein 28 can be fastened to a common colloid particle 30 to which protein 28 is itself fastened. This can be accomplished by forming a mixed SAM on colloid particle 30 including protein 28, the signaling entity (optionally electroactive such as ferrocene) and, optionally, non-specific-binding-inhibiting SAM-forming species. Where an electroactive signaling entity 31 is used, its proximity, or lack thereof, to locations 40 and 42 can easily be determined by those of ordinary skill in the art with electrodes 44 and 46 using known electrochemical techniques such as CV or ACV, as mentioned.

[0062] No matter which signaling technique is used, once it is determined that a signaling entity is present proximate location 40 but not present proximate location 42, electromagnet 50 is de-activated, and beads that had been drawn proximate location 42 are selectively released while beads proximate location 40 are retained in place magnetically. Following release of beads from location 42, at least location 42, and optionally locations 42 and 40, are rinsed to remove all beads not magnetically retained at location 40. Then, a fluid that preferably does not contain beads is introduced into the environment of surface locations 40 and 42, beads 20 and 22 are released from surface location 40 and suspended in the fluid, and the steps of magnetically drawing beads to surface locations, determining locations at which signaling entities are present, and releasing beads from surface locations where signaling entities are not present is repeated. Specifically, following the release of beads 20 and 22 from surface areas 40 electromagnets 48 and 50 are re-activated. Ideally, beads 20 and 22 will then be drawn to different surface locations, effectively separating them from each other (as shown in **FIG. 5**; repetition of the assay will result in such separation eventually). If bead 20 is drawn to surface location 42 (identified by the signaling entity), then electromagnet 48 can be deactivated, releasing bead 22 which can be removed by rinsing, with only bead 20 remaining immobilized to a surface location. Drug candidate 24 then can be identified as one that has binding affinity for target protein 28. This can be accomplished by any of a variety of known techniques. In one technique, each bead is tagged with a unique radiolabel which is read to reveal the chemical history of its attached candidate drug. Other labeling schemes involving nucleic acid or peptide labeling of each synthetic step are possible. Another approach involves cleaving candidate drug 24 from bead 20 and analyzing it using a technique such as mass spectrometry.

[0063] As illustrated in FIGS. **1-5**, only two types of beads (20 and 22), carrying only two types of candidate drugs (D and D'), are shown. In an actual assay hundreds, thousands, or millions of beads, each carrying a unique drug, are used. Beads carrying drug candidates are readily available or preparable by those of ordinary skill in the art, for example, using combinatorial synthesis, solid phase synthesis approaches, or postsynthetic attachment. In a typical high-volume screening technique it may be desirable to screen, e.g., ten million drugs (D, D', D", . . .) against interaction with a binding partner. In conventional technology this would typically involve ten million experiments, or parallel screening (for example on multi-well plates) of ten million drugs, a time-consuming and laborious process. In the present invention, however, a much smaller number of surface locations (40, 42, . . .) need be employed than the number of drug candidates screened. The size of the surface areas, and their number, is selected such that many beads (20, 22, . . .) presenting many drug species are drawn to a single surface location. In a typical assay only one, or only a few of these beads will be immobilized with respect to signaling entities. Thus, the number of surface locations can be chosen, in conjunction with the number of beads and drug candidates and the number of expected positive binding interactions, such that in the first step of drawing the beads to separate surface locations at least some of the surface locations (generally many or most surface locations) will not exhibit the presence of a signaling entity. Once certain locations are identified as not attracting signaling entities, all beads from those locations can be released and rinsed away, and beads that are held at surface locations (surface locations exhibiting signaling entities; now a much smaller number) can be released, redistributed, redrawn to surface areas, and the assay repeated until only one magnetic bead, statistically, is present at each surface location. At that point,